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10/693,022	10/23/2003	Vladimir Bulovic	MIT-PT10301	1746

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PHILADELPHIA, PA 19103

EXAMINER
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BODDIE, WILLIAM

ART UNIT	PAPER NUMBER
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2629

NOTIFICATION DATE	DELIVERY MODE
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ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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eoffice@volpe-koenig.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/693,022	<b>Applicant(s)</b> BULOVIC ET AL.	
	<b>Examiner</b> WILLIAM BODDIE	<b>Art Unit</b> 2629	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,7,8,12-14,16-18,20,21 and 29-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 7-8, 12-14, 16-18, 20-21 and 29-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. In an amendment dated, April 11<sup>th</sup>, 2011, the Applicant amended claims 1, 14, 16, 29, 33, 36, and 39. Currently claims 1, 7-8, 12-14, 16-18, 20-21 and 29-49 are pending.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1, 7-8, 12-14, 16-18, 20-21 and 29-49 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 7-8, 12-14, 16-17, 20, 29-35, and 43-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henmi et al. (US 7,154,492) in view of Cok et al. (US 7,064,733; hereinafter Cok-733).

**With respect to claim 1**, Henmi discloses, an array (fig. 12), comprising:  
a plurality of light emitting devices (20 in fig. 12) disposed on a transparent substrate (11 in fig. 4), the transparent substrate having an upper surface that contacts each light emitting device (fig. 4), a lower surface distal from the plurality of light emitting device and a plurality of side surfaces, each of the side surfaces being substantially perpendicular to the upper surface (fig. 4),

wherein each of the plurality of light emitting devices is individually addressed to display an image (fig. 12, for example); and

at least one photodetector (23 in fig. 4) non-removably flush mounted (Ex in fig. 19), on the upper surface of the transparent substrate for detecting a fraction of waveguided light emitted from the plurality of light emitting devices (figs. 10-11; col. 9, line 65 – col. 10, line 17), wherein another fraction of waveguided light is edge emitted (figs. 10-11; col. 9, line 65 – col. 10, line 17; note that the figure 10 embodiment has only a single photodetector along a single side of the substrate. Light propagating towards other sides of the substrate will not be detected and will be edge emitted. Note Henmi's express discussion of including additional photodetectors to detect all of the light emitted by a pixel (fig. 11; col. 9, line 65 – col. 10, line 17)).

Henmi does not expressly disclose arranging the photodetector on the lower surface of the transparent substrate.

Cok-733 discloses, an array, comprising:

a plurality of light emitting devices (42-46 in fig. 4) disposed under a transparent substrate (col. 4, lines 35-38; "transparent electrically insulative layer"); and

at least one photodetector (48-52 in fig. 4) non-removably flush mounted (col. 4, lines 44-61; figs. 5-6), with a detector side facing the plurality of light emitting devices, on the lower surface of the transparent substrate (col. 4, lines 35-38) for detecting a fraction of waveguided light emitted from the plurality of light emitting devices, wherein another fraction of waveguided light is edge emitted (figs. 5-6; col. 4, lines 44-61).

Henmi and Cok-733 are analogous art because they are both from the same field of endeavor namely, detecting light emitted by LEDs and compensating the driving of the LEDs based on the detected light.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the opposite surface photosensors, taught by Cok-733, on the transparent substrate of Henmi.

The motivation for doing so would have been provide improved luminous uniformity (Cok-733; col. 2, lines 41-47).

**With respect to claim 7**, Henmi and Cok-733 disclose, the array of claim 1 (see above).

Henmi further discloses, locating a photodetector over the outer periphery edges of the upper surface (23 in figs. 4 and 11).

**With respect to claim 8**, Henmi and Cok-733 disclose, the array of claim 1 (see above).

Henmi further discloses, a feedback circuit (23, 40 in fig. 5, for example) that measures a brightness level for each of the plurality of light emitting devices (S11 in fig. 9) and varies a voltage applied to individual ones of the light emitting device to maintain a brightness level of each of the light emitting devices at a substantially constant level (S14-S17 in fig. 9).

**With respect to claim 12**, Henmi and Cok-733 disclose, the array of claim 8 (see above).

Henmi further discloses, wherein the feedback circuit includes a compensation factor generator (correction value; S14-S17 in fig. 9) for generating a compensation factor for each of the plurality of light emitting devices (S11 in fig. 9)

Henmi does not expressly disclose a memory array.

Cok-733 discloses, a feedback circuit includes a compensation factor generator (14-16 in fig. 1) for generating a compensation factor for each of the plurality of light emitting devices (col. 6, lines 9-44) and a memory array for storing the compensation factor for each of the plurality of light emitting devices (18 in fig. 1; col. 6, lines 9-44).

At the time of the invention it would have been obvious to one of ordinary skill in the art to store the correction factors generated by Henmi in a memory array as taught by Cok-733.

The motivation for doing so would have been to store an ideal luminance to compare the current state of the display against, thus achieving a more uniform and ideal luminance (col. 6, lines 9-44).

**With respect to claim 13**, Henmi and Cok-733 disclose, the array of claim 1 (see above).

Henmi further discloses, a display (fig. 12) comprising an array of light emitting devices.

**With respect to claim 14**, Henmi discloses, a method for forming an array, comprising:

forming a plurality of light emitting devices (20 in fig. 12) disposed on a transparent substrate (11 in fig. 4), the transparent substrate having an upper surface

that contacting the light emitting devices (fig. 4), a lower surface distal from the light emitting devices and at least one side surface substantially perpendicular to said upper surface of the substrate(fig. 4), wherein each of the plurality of light emitting devices is individually addressed to display an image (fig. 12, for example); and

forming a photodetector (23 in fig. 4) non-removably flush mounted (Ex in fig. 19), on the upper surface of the transparent substrate for detecting a fraction of waveguided light emitted from the plurality of light emitting devices (figs. 10-11; col. 9, line 65 – col. 10, line 17), wherein another fraction of waveguided light is edge emitted (figs. 10-11; col. 9, line 65 – col. 10, line 17; note that the figure 10 embodiment has only a single photodetector along a single side of the substrate. Light propagating towards other sides of the substrate will not be detected and will be edge emitted. Note Henmi's express discussion of including additional photodetectors to detect all of the light emitted by a pixel (fig. 11; col. 9, line 65 – col. 10, line 17)).

Henmi does not expressly disclose arranging the photodetector on the lower surface of the transparent substrate.

Cok-733 discloses, an array, comprising:

a plurality of light emitting devices (42-46 in fig. 4) disposed under a transparent substrate (col. 4, lines 35-38; "transparent electrically insulative layer"); and

at least one photodetector (48-52 in fig. 4) non-removably flush mounted (col. 4, lines 44-61; figs. 5-6), with a detector side facing the plurality of light emitting devices, on the lower surface of the transparent substrate (col. 4, lines 35-38) for detecting a

fraction of waveguided light emitted from the plurality of light emitting devices, wherein another fraction of waveguided light is edge emitted (figs. 5-6; col. 4, lines 44-61).

Henmi and Cok-733 are analogous art because they are both from the same field of endeavor namely, detecting light emitted by LEDs and compensating the driving of the LEDs based on the detected light.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the opposite surface photosensors, taught by Cok-733, on the transparent substrate of Henmi.

The motivation for doing so would have been provide improved luminous uniformity (Cok-733; col. 2, lines 41-47).

**With respect to claim 16**, Henmi and Cok-733 disclose, the method of claim 14 (see above).

Henmi further discloses, forming the photodetector on the side surface of the substrate (23 in figs. 4 and 11).

**With respect to claim 17**, Henmi and Cok-733 disclose, the method of claim 14 (see above).

Henmi further discloses, wherein the photodetector includes a plurality of photodetectors (fig. 11).

**With respect to claim 20**, claim 20 is seen as sufficiently equivalent to claim 8. As such claim 20 is rejected on the same merits shown above in claim 8.

**With respect to claim 29**, Henmi discloses, an array (fig. 12), comprising:



a plurality of light emitting devices (20 in fig. 12) formed on a surface of a transparent substrate (11 in fig. 4), the transparent substrate having an upper surface that contacts each light emitting device (fig. 4), a lower surface distal from the plurality of light emitting device and a plurality of side surfaces (fig. 4),

wherein each of the plurality of light emitting devices is individually addressed to display an image (fig. 12, for example); and

at least two photodetectors (23 in fig. 4) non-removably flush mounted (Ex in fig. 19), on the upper surface of the transparent substrate for detecting a fraction of waveguided light emitted from the plurality of light emitting devices (figs. 10-11; col. 9, line 65 – col. 10, line 17), wherein another fraction of waveguided light is edge emitted (figs. 10-11; col. 9, line 65 – col. 10, line 17; note that the figure 10 embodiment has only a single photodetector along a single side of the substrate. Light propagating towards other sides of the substrate will not be detected and will be edge emitted. Note Henmi's express discussion of including additional photodetectors to detect all of the light emitted by a pixel (fig. 11; col. 9, line 65 – col. 10, line 17)).

Henmi does not expressly disclose arranging the photodetector on the lower surface of the transparent substrate.

Cok-733 discloses, an array, comprising:

a plurality of light emitting devices (42-46 in fig. 4) disposed under a transparent substrate (col. 4, lines 35-38; "transparent electrically insulative layer"); and

at least two photodetectors (48-52 in fig. 4) non-removably flush mounted (col. 4, lines 44-61; figs. 5-6), with a detector side facing the plurality of light emitting devices,

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on the lower surface of the transparent substrate (col. 4, lines 35-38) for detecting a fraction of waveguided light emitted from the plurality of light emitting devices, wherein another fraction of waveguided light is edge emitted (figs. 5-6; col. 4, lines 44-61).

Henmi and Cok-733 are analogous art because they are both from the same field of endeavor namely, detecting light emitted by LEDs and compensating the driving of the LEDs based on the detected light.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the opposite surface photosensors, taught by Cok-733, on the transparent substrate of Henmi.

The motivation for doing so would have been provide improved luminous uniformity (Cok-733; col. 2, lines 41-47).

**With respect to claim 30**, Henmi and Cok-733 disclose, the array of claim 29 (see above).

Henmi further discloses, at least one additional photodetector formed over the outer periphery edges of the surface of the transparent substrate (23a/b in fig. 11).

**With respect to claim 31**, Henmi and Cok-733 disclose, the array of claim 29 (see above).

Henmi further discloses, a feedback circuit (23-43 in fig. 5) that measures a brightness level for each of the plurality of light emitting devices, and varies a voltage applied to individual ones of the light emitting devices to maintain a brightness level of each of the light emitting devices at a substantially constant level (S11-S17 in fig. 9).

**With respect to claim 32**, Henmi and Cok-733 disclose, the array of claim 31 (see above).

Henmi further discloses, wherein the feedback circuit includes a compensation factor generator (correction value; S14-S17 in fig. 9) for generating a compensation factor for each of the plurality of light emitting devices (S11 in fig. 9)

Henmi does not expressly disclose a memory array.

Cok-733 discloses, a feedback circuit includes a compensation factor generator (14-16 in fig. 1) for generating a compensation factor for each of the plurality of light emitting devices (col. 6, lines 9-44) and a memory array for storing the compensation factor for each of the plurality of light emitting devices (18 in fig. 1; col. 6, lines 9-44).

At the time of the invention it would have been obvious to one of ordinary skill in the art to store the correction factors generated by Henmi in a memory array as taught by Cok-733.

The motivation for doing so would have been to store an ideal luminance to compare the current state of the display against, thus achieving a more uniform and ideal luminance (col. 6, lines 9-44).

**With respect to claim 33**, Henmi discloses, an array (fig. 12), comprising:  
a plurality of light emitting devices (20 in fig. 12) formed on a surface of a transparent substrate (11 in fig. 4), the transparent substrate having an upper surface that contacts each light emitting device (fig. 4), a lower surface distal from the plurality of light emitting device and a plurality of side surfaces (fig. 4),

wherein each of the plurality of light emitting devices is individually addressed to display an image (fig. 12, for example); and

at least one photodetector (23 in fig. 4) non-removably flush mounted (Ex in fig. 19), on the upper surface of the transparent substrate for detecting a fraction of waveguided light emitted from the plurality of light emitting devices (figs. 10-11; col. 9, line 65 – col. 10, line 17), wherein another fraction of waveguided light is edge emitted (figs. 10-11; col. 9, line 65 – col. 10, line 17; note that the figure 10 embodiment has only a single photodetector along a single side of the substrate. Light propagating towards other sides of the substrate will not be detected and will be edge emitted. Note Henmi's express discussion of including additional photodetectors to detect all of the light emitted by a pixel (fig. 11; col. 9, line 65 – col. 10, line 17)),

wherein at least one light emitting device comprises an OLED (col. 1, line 7-12).

Henmi does not expressly disclose arranging the photodetector on the lower surface of the transparent substrate.

Cok-733 discloses, an array, comprising:

a plurality of light emitting devices (42-46 in fig. 4) disposed under a transparent substrate (col. 4, lines 35-38; "transparent electrically insulative layer"); and

at least one photodetector (48-52 in fig. 4) non-removably flush mounted (col. 4, lines 44-61; figs. 5-6), with a detector side facing the plurality of light emitting devices, on the lower surface of the transparent substrate (col. 4, lines 35-38) for detecting a fraction of waveguided light emitted from the plurality of light emitting devices, wherein another fraction of waveguided light is edge emitted (figs. 5-6; col. 4, lines 44-61).

Henmi and Cok-733 are analogous art because they are both from the same field of endeavor namely, detecting light emitted by LEDs and compensating the driving of the LEDs based on the detected light.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the opposite surface photosensors, taught by Cok-733, on the transparent substrate of Henmi.

The motivation for doing so would have been provide improved luminous uniformity (Cok-733; col. 2, lines 41-47).

**With respect to claim 34**, Henmi and Cok-733 discloses, the array of claim 33 (see above).

Henmi further discloses, a feedback circuit (23-43 in fig. 5) that measures a brightness level for each of the plurality of light emitting devices, and varies a voltage applied to individual ones of the light emitting devices to maintain a brightness level of each of the light emitting devices at a substantially constant level (S11-S17 in fig. 9).

**With respect to claim 35**, Henmi and Cok-733 disclose, the array of claim 34 (see above).

Henmi further discloses, wherein the feedback circuit includes a compensation factor generator (correction value; S14-S17 in fig. 9) for generating a compensation factor for each of the plurality of light emitting devices (S11 in fig. 9)

Henmi does not expressly disclose a memory array.

Cok-733 discloses, a feedback circuit includes a compensation factor generator (14-16 in fig. 1) for generating a compensation factor for each of the plurality of light

emitting devices (col. 6, lines 9-44) and a memory array for storing the compensation factor for each of the plurality of light emitting devices (18 in fig. 1; col. 6, lines 9-44).

At the time of the invention it would have been obvious to one of ordinary skill in the art to store the correction factors generated by Henmi in a memory array as taught by Cok-733.

The motivation for doing so would have been to store an ideal luminance to compare the current state of the display against, thus achieving a more uniform and ideal luminance (col. 6, lines 9-44).

**With respect to claim 43**, Henmi and Cok-733 disclose, the array of claim 8 (see above).

Henmi further discloses, a feedback circuit (23-43 in fig. 5) that measures a brightness level for each of the plurality of light emitting devices, and varies a voltage applied to individual ones of the light emitting devices to maintain a brightness level of each of the light emitting devices at a substantially constant level (S11-S17 in fig. 9).

**With respect to claims 44-47**, Henmi and Cok-733 disclose, the arrays and methods of claims 1, 14, 29, and 33 (see above).

Henmi further discloses, wherein each of the plurality of light emitting devices is selectively activated to display the image (fig. 12).

5. Claims 36-38 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henmi et al. (US 7,154,492) in view of Cok et al. (US 7,064,733; hereinafter Cok-733) and further in view of Hunter (US 6,356,029).

**With respect to claim 36**, Henmi discloses, an array (fig. 12), comprising:

a plurality of light emitting devices (20 in fig. 12) formed on a surface of a transparent substrate (11 in fig. 4), the transparent substrate having an upper surface that contacts each light emitting device (fig. 4), a lower surface distal from the plurality of light emitting device and a plurality of side surfaces (fig. 4),

wherein each of the plurality of light emitting devices is individually addressed to display an image (fig. 12, for example); and

a photodetector (23 in fig. 4) non-removably flush mounted (Ex in fig. 19), on the upper surface of the transparent substrate for detecting a fraction of waveguided light emitted from the plurality of light emitting devices (figs. 10-11; col. 9, line 65 – col. 10, line 17), wherein another fraction of waveguided light is edge emitted (figs. 10-11; col. 9, line 65 – col. 10, line 17; note that the figure 10 embodiment has only a single photodetector along a single side of the substrate. Light propagating towards other sides of the substrate will not be detected and will be edge emitted. Note Henmi's express discussion of including additional photodetectors to detect all of the light emitted by a pixel (fig. 11; col. 9, line 65 – col. 10, line 17)),

wherein at least one light emitting device comprises an OLED (col. 1, line 7-12).

Henmi does not expressly disclose arranging the photodetector on the lower surface of the transparent substrate.

Cok-733 discloses, an array, comprising:

a plurality of light emitting devices (42-46 in fig. 4) disposed under a transparent substrate (col. 4, lines 35-38; "transparent electrically insulative layer"); and

a photodetector (48-52 in fig. 4) non-removably flush mounted (col. 4, lines 44-61; figs. 5-6), with a detector side facing the plurality of light emitting devices, on the lower surface of the transparent substrate (col. 4, lines 35-38) for detecting a fraction of waveguided light emitted from the plurality of light emitting devices, wherein another fraction of waveguided light is edge emitted (figs. 5-6; col. 4, lines 44-61).

Henmi and Cok-733 are analogous art because they are both from the same field of endeavor namely, detecting light emitted by LEDs and compensating the driving of the LEDs based on the detected light.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the opposite surface photosensors, taught by Cok-733, on the transparent substrate of Henmi.

The motivation for doing so would have been provide improved luminous uniformity (Cok-733; col. 2, lines 41-47).

Neither Cok-733 nor Henmi expressly disclose a PLED.

Hunter discloses a PLED display suffering from ageing effects (col. 2, lines 31-37).

Hunter and Henmi are analogous art because they are both directed to solving the same problem namely, degradation of display quality over time in EL devices.

At the time of the invention it would have been obvious to replace the OLED devices of Henmi with the PLED elements of Hunter.

The motivation for doing so would have been the ease of fabrication of PLED elements (Hunter; col. 1, lines 23-26).



**With respect to claim 37**, Henmi, Cok-733 and Hunter disclose, the array of claim 36 (see above).

Henmi further discloses, a feedback circuit (23-43 in fig. 5) that measures a brightness level for each of the plurality of light emitting devices, and varies a voltage applied to individual ones of the light emitting devices to maintain a brightness level of each of the light emitting devices at a substantially constant level (S11-S17 in fig. 9).

**With respect to claim 38**, Henmi, Cok-733 and Hunter disclose, the array of claim 37 (see above).

Henmi further discloses, wherein the feedback circuit includes a compensation factor generator (correction value; S14-S17 in fig. 9) for generating a compensation factor for each of the plurality of light emitting devices (S11 in fig. 9)

Henmi does not expressly disclose a memory array.

Cok-733 discloses, a feedback circuit includes a compensation factor generator (14-16 in fig. 1) for generating a compensation factor for each of the plurality of light emitting devices (col. 6, lines 9-44) and a memory array for storing the compensation factor for each of the plurality of light emitting devices (18 in fig. 1; col. 6, lines 9-44).

At the time of the invention it would have been obvious to one of ordinary skill in the art to store the correction factors generated by Henmi in a memory array as taught by Cok-733.

The motivation for doing so would have been to store an ideal luminance to compare the current state of the display against, thus achieving a more uniform and ideal luminance (col. 6, lines 9-44).

**With respect to claim 48**, Henmi, Hunter and Cok-733 disclose, the array of claim 36 (see above).

Henmi further discloses, wherein each of the plurality of light emitting devices is selectively activated to display the image (fig. 12).

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Henmi et al. (US 7,154,492) in view of Cok et al. (US 7,064,733; hereinafter Cok-733) and further in view of Cok (US 7,026,597; hereinafter Cok-597).

**With respect to claim 18**, Henmi and Cok-733 discloses, the method of claim 17 (see above).

Henmi further discloses, forming the photodetector on the side surface of the substrate (23 in figs. 4 and 11).

Neither Henmi nor Cok-733 expressly disclose, that the photo detectors are formed on each side surface.

Cok-597 discloses, forming photodetectors on each edge of a display (20 in fig. 5).

Cok-597, Cok-733 and Henmi are analogous art because they are from the same field of endeavor namely, placement of photodetectors within a display.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include photodetectors along each side as taught by Cok-597 in the display of Henmi and Cok-733.

The motivation for doing so would have been improved illumination detection (Cok-597; col. 1, lines 65-67).

7. Claims 39-42 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henmi et al. (US 7,154,492) in view of Cok et al. (US 7,064,733; hereinafter Cok-733) and further in view of Bawendi et al. (US 6,501,091).

**With respect to claim 39**, Henmi discloses, an array (fig. 12), comprising:

a plurality of light emitting devices (20 in fig. 12) formed on a surface of a transparent substrate (11 in fig. 4), the transparent substrate having an upper surface that contacts each light emitting device (fig. 4), a lower surface distal from the plurality of light emitting device and a plurality of side surfaces (fig. 4),

wherein each of the plurality of light emitting devices is individually addressed to display an image (fig. 12, for example); and

a photodetector (23 in fig. 4) non-removably flush mounted (Ex in fig. 19), on the upper surface of the transparent substrate for detecting a fraction of waveguided light emitted from the plurality of light emitting devices (figs. 10-11; col. 9, line 65 – col. 10, line 17), wherein another fraction of waveguided light is edge emitted (figs. 10-11; col. 9, line 65 – col. 10, line 17; note that the figure 10 embodiment has only a single photodetector along a single side of the substrate. Light propagating towards other sides of the substrate will not be detected and will be edge emitted. Note Henmi's express discussion of including additional photodetectors to detect all of the light emitted by a pixel (fig. 11; col. 9, line 65 – col. 10, line 17)),

wherein at least one light emitting device comprises an OLED (col. 1, line 7-12).

Henmi does not expressly disclose arranging the photodetector on the lower surface of the transparent substrate.

Cok-733 discloses, an array, comprising:

a plurality of light emitting devices (42-46 in fig. 4) disposed under a transparent substrate (col. 4, lines 35-38; "transparent electrically insulative layer"); and

a photodetector (48-52 in fig. 4) non-removably flush mounted (col. 4, lines 44-61; figs. 5-6), with a detector side facing the plurality of light emitting devices, on the lower surface of the transparent substrate (col. 4, lines 35-38) for detecting a fraction of waveguided light emitted from the plurality of light emitting devices, wherein another fraction of waveguided light is edge emitted (figs. 5-6; col. 4, lines 44-61).

Henmi and Cok-733 are analogous art because they are both from the same field of endeavor namely, detecting light emitted by LEDs and compensating the driving of the LEDs based on the detected light.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the opposite surface photosensors, taught by Cok-733, on the transparent substrate of Henmi.

The motivation for doing so would have been provide improved luminous uniformity (Cok-733; col. 2, lines 41-47).

Neither Cok-733 nor Henmi expressly disclose a QDLED.

Bawendi discloses a QDLED display (title).

Bawendi and Henmi are analogous art because they are both from the same field of endeavor namely, high quality LED based displays.

At the time of the invention it would have been obvious to replace the OLED devices of Henmi with the QDLED elements of Bawendi.

The motivation for doing so would have been the availability of additional color choices (Bawendi; col. 1, lines 35-53).

**With respect to claim 40**, Henmi, Cok-733 and Bawendi disclose, the array of claim 39 (see above).

Henmi further discloses, a feedback circuit (23-43 in fig. 5) that measures a brightness level for each of the plurality of light emitting devices, and varies a voltage applied to individual ones of the light emitting devices to maintain a brightness level of each of the light emitting devices at a substantially constant level (S11-S17 in fig. 9).

**With respect to claim 41**, Yu, Yuyama and Bawendi disclose, the array of claim 40 (see above).

Henmi further discloses, wherein the feedback circuit includes a compensation factor generator (correction value; S14-S17 in fig. 9) for generating a compensation factor for each of the plurality of light emitting devices (S11 in fig. 9)

Henmi does not expressly disclose a memory array.

Cok-733 discloses, a feedback circuit includes a compensation factor generator (14-16 in fig. 1) for generating a compensation factor for each of the plurality of light emitting devices (col. 6, lines 9-44) and a memory array for storing the compensation factor for each of the plurality of light emitting devices (18 in fig. 1; col. 6, lines 9-44).

At the time of the invention it would have been obvious to one of ordinary skill in the art to store the correction factors generated by Henmi in a memory array as taught by Cok-733.

The motivation for doing so would have been to store an ideal luminance to compare the current state of the display against, thus achieving a more uniform and ideal luminance (col. 6, lines 9-44).

**With respect to claim 42**, Henmi, when combined with Bawendi and Cok-733, discloses a display (Henmi; fig. 12) comprising the array of claim 39 (see above).

**With respect to claim 49**, Henmi, Cok-733 and Bawendi disclose, the array of claim 39 (see above).

Henmi further discloses, wherein each of the plurality of light emitting devices is selectively activated to display the image (fig. 12).

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM BODDIE whose telephone number is (571)272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/William L Boddie/  
Examiner, Art Unit 2629  
7/19/11